



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/567,259	02/06/2006	Shigeo Yukawa	10873.1819USWO	3059
52835 7590 06/18/2008 HAMRE, SCHUMANN, MUELLER & LARSON, P.C. P.O. BOX 2902 MINNEAPOLIS, MN 55402-0902				
EXAMINER				
DOAK, JENNIFER L				
ART UNIT		PAPER NUMBER		
2872				
MAIL DATE		DELIVERY MODE		
06/18/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/567,259

Applicant(s)

YUKAWA ET AL.

Examiner

Jennifer L. Doak

Art Unit

2872

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 April 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 and 20-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 and 20-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-8508)
- Paper No(s)/Mail Date 2/20/08; 4/11/07
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(c), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(c) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/21/08 has been entered.

Specification

The title of the invention is not descriptive. "The title should be brief but technically accurate and descriptive and should contain fewer than 500 characters," MPEP §606. Specifically, statements concerning the general type or nature of the entire system or its components that are common to many other similar elements or systems that are known in the art are not sufficiently descriptive to provide "informative value in indexing, classifying, searching, etc.," MPEP §606.01. Examiner recommends directing the title to what Applicant believes is the point of novelty, since it is by the novelty that "indexing, classifying, searching, etc." is generally accomplished. Nevertheless, it should be noted that, pursuant to MPEP §606.01, "[i]f a satisfactory title is not supplied by the applicant, the examiner may, at the time of allowance, change the title by examiner's amendment."

A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Objections

Claim 5 is objected to because of the following informalities: because it is unclear exactly what Applicant means, the abbreviation wt% should be converted to unabbreviated words. For the purposes of examination it is assumed that Applicant means "weight percentage." Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-18 and 20-22 rejected under 35 U.S.C. 103(a) as being unpatentable over Bailey (US 4505967) and Hedblom ((US 6479132).

Regarding claims 1 and 22, Examiner makes the following findings of fact: Bailey discloses an enclosed lens type retroreflective sheet (Fig. 3) comprising a surface layer (10a) including at least one layer, a focusing layer (19c) containing glass spheres (27), and a metal reflective layer (28) on the back side of the focusing layer (Fig. 3), the metal reflective layer is formed on the back side of the focusing layer to follow the shape of the glass spheres (Fig. 3), and the glass spheres (col. 10, lns. 39-44) include a first glass sphere group that provides reflective performance at a small observation angle (as illustrated in Fig. 7, Curve B, between approx. 0° and 20°) and up to a large incidence angle and a second glass sphere group that provides reflective performance at a larger observation angle and up to a large incidence angle (as illustrated in Fig. 7, Curve B, between approx. 20° and 50°) in the same focusing layer (Fig. 3). Bailey does not disclose that the glass spheres are disposed at random locations in the thickness direction of the focusing layer or that the focusing layer for the second glass sphere group is thinner at the glass spheres than a focus formation position for the glass spheres. Bailey and Hedblom are related as retro-reflector bead systems, and would have been known to an ordinarily skilled artisan at the time of invention. Hedblom teaches that the glass spheres are disposed at random locations (col. 10, lns. 38-41) in the thickness direction of the focusing layer and that the focusing layer for the second glass sphere group is thinner at the glass spheres than a focus formation position for the glass spheres (Fig. 4; col. 3, lns. 40-44).

Examiner additionally finds that the device of Bailey constitutes a base device upon which the claimed invention can be seen as an improvement. Bailey and Hedblom are comparable devices, since both are retroreflector systems with beads, focusing layers backed with shape-fitted reflective layers. Additional layers are optional, but contemplated by Hedblom (col. 2, lns. 65-67). As set forth above, the comparable device of Hedblom was improved the same way as the claimed device: random bead distribution and varied thickness of the focusing layer. The benefit of such an improvement is that there is quality reflection in both wet and dry conditions (Hedblom, col. 6, lns. 39-67). Moreover, Examiner finds that an ordinarily skilled artisan could have applied the known improvement in the same way to the base device, and the results would have been predictable to an ordinarily skilled artisan at the time of invention.

Therefore, Examiner concludes, pursuant to *In re Nilssen*, 7 USPQ2d 1673 (Fed. Cir. 1988) and *Ruiz v. AB Chance Co.*, 69 USPQ2d 1686 (Fed Cir. 2004), that it would have been obvious to an ordinarily skilled artisan at the time of invention to modify the retroreflective sheet of Bailey with the randomness of the beads and variable focus layer thicknesses of Hedblom, since such a combination would yield predictable results to an ordinarily skilled artisan of the time.

Further regarding claim 22, the elements addressed previously in the discussion of claim 1 are hereby incorporated, and the combination discloses the following additional elements: a sign having a sign face (Bailey, col. 1, lns. 53-60), an external illumination source, where the external illumination source is disposed at a fixed distance from the illumination source to the sign face is within a range of at least 1 m and no more than 100 m (i.e., it is well known in the art that a truck with a sign on it, as contemplated above by Bailey, if driving along a highway or

street at night would likely pass many fixed illumination sources within the range of 1 m to 100 m of the sign on the side of the truck as it drove past street lamps. Moreover, it is noted that the flux, that is the luminous intensity of light, decreases from its source in the proportion of $1/r^2$, where r is the distance from the source; therefore, the diminished capacity of a fixed position light would render it weak to useless at larger distances such as 100 m.). The purpose of fixed roadside lighting is to illuminate stationary and moving objects, including other vehicles, for the safety of drivers along the road. Lighting must be placed at an appropriate distance from the object or area to illuminate relative to its flux capacity to be effective.

Therefore, it would have been obvious to an ordinarily skilled artisan at the time of invention to use a fixed light to illuminate a sign face at a range of 1 m to 100 m, since sufficient illumination is necessary to use it as a safety feature of the road.

Regarding claim 2, the combination further discloses that the first glass sphere group comprises spheres in contact with the surface layer (Bailey, Fig. 3), and the second glass sphere group comprises spheres located away from the surface layer (this is true via the teaching of the combination that the spheres can be randomly distributed in the focusing layer direction; Hedblom, col. 10, lns. 38-41).

Regarding claim 3, the combination further discloses that the metal reflective layer of the first glass sphere group is formed at the focus formation position of the glass spheres (Bailey, col. 1, lns. 20-26).

Regarding claim 4, the combination further discloses that the focusing layer formed in the form of concentric circles on the glass sphere surfaces of the glass spheres in contact with the surface layer has a thickness at which the maximum reflective performance is exhibited at an

observation angle of 0.2° and an incidence angle of 5° (Bailey, Fig. 7: Curve B, in that there is a local maximum within the claimed range as well as another, approximately equal maximum later in the same curve between 20° and 50°), the thickness of the focusing layer of the glass spheres located away from the surface is less than the thickness of the focusing layer of the glass spheres in contact with the surface layer (i.e., this limitation is seen to be met by the combination since the spheres have different thicknesses of the focusing layer and are randomly dispersed), and the glass spheres located away from the surface layer exhibit retroreflective performance at a relatively larger observation angle than the glass spheres in contact with the surface layer (i.e., this limitation is seen to be met by the combination since the spheres have different thicknesses of the focusing layer and are randomly dispersed).

Regarding claim 5, the combination does not proportion of glass spheres in contact with the surface layer is from 50 to 90 wt% of the total glass spheres. However, this limitation is inherent to the structure previously recited, and the claim language is necessarily met by that structure. Absent a showing to the contrary, the features recited above would be met by the structure of the combined teachings of the prior art or would be met during use of the same.

Regarding claim 6, the combination further discloses the refractive index of the glass spheres is within a range of at least 2.10 and no more than 2.40 (Hedblom, col. 4, lns. 63-67).

Regarding claim 7, the combination further discloses the glass spheres have a median diameter within a range of at least $35\text{ }\mu\text{m}$ and no more than $75\text{ }\mu\text{m}$ (Bailey, col. 4, lns. 37-41), and at least 80% of the glass spheres have a median diameter within a range of $\pm 10\text{ }\mu\text{m}$ (col. 4, lns. 37-41).

Regarding Claims 8-18, the combination further discloses that specific chemicals can be used, including polyvinyl acetal resin, polyvinyl butyral resin, olefin copolymers, polyester resins, alkyd resins, polyurethane resins, vinyl resins, and acrylic polymers (Hedblom, col. 7, lines 18-33; col. 9, lines 10-37; col. 10, lines 1-19). The weight relationships, transition point temperatures, solvent relationships, and related anti-foaming agents are not explicitly disclosed, but are well known in the art. Therefore, absent a showing of criticality, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the chemicals and the claimed relations, since they result in retro-reflectors that remain retro-reflective in wet or dry conditions.

Regarding claims 20 and 21, the combination further discloses the illumination source emits light that is incident on the sign face at an incidence angle of between at least 0° and 50° to the sign face (Bailey, Fig. 7); that the sign face exhibits reflective performance of at least 0.07 at an observation angle of 35° when reference light (Bailey, Fig. 7); that the reflective performance at an observation angle of 40° and an incidence angle of 50° is at least 0.055, and so forth as set forward in the remainder of claims 20 and 21). The combination does not disclose that the angle cannot be more than 50° or that the color temperature of the light is 2856K. The wavelength, whose color temperature is 2856K, is a well known marker line for mercury vapor emissions. Mercury lamps are notoriously well known in the art for outdoor light sources, for signs or for general illumination. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use a mercury lamp to illuminate a sign.

The combination does not explicitly disclose that the retroreflective coefficient $R' = I/ES \cdot A$; However, this feature is seen to be an inherent teaching of that device since the structure

as claimed is disclosed, and it is apparent that the same structure must be present for the device to function as intended.

Response to Arguments

Applicant's arguments with respect to claims 1-18 and 20-22 have been considered but are moot in view of the new ground(s) of rejection.

Applicant has not adequately traversed the "well known" assertion made by Examiner in the previous Office Action (and is re-asserted above). Adequate traversal requires that the Applicant specifically point out the supposed errors in the Examiner's action. In contrast, Applicant did not address the taking of Official Notice. Since the response lacks sufficient specificity, the "well-known" statement of the previous action (i.e., with respect to the polymers and material properties mentioned in claims 8-18; and the use of mercury lamps, which have the 2856K marker emission line as in claims 20 and 21) is deemed admitted prior art, MPEP §2144.03C.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer L. Doak whose telephone number is (571)272-9791. The examiner can normally be reached on Mon-Thurs: 7:30A-5:00P, Alt Fri: 7:30A-4:00P (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephone B. Allen can be reached on 571-272-2434. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JD
6/16/08

/Stephone B. Allen/
Supervisory Patent Examiner
Art Unit 2872